

**ABSTRACT**

A regulator supplies a regulated voltage to an electronic component with a plurality of phases with varying response rates. The regulator includes an output node that provides a regulated supply voltage, a first main-phase drive circuit that provides a first main load current to the output node and that has an on time and an off time, and a  
5 first transient-phase drive circuit that has a first transient load current to the output node that has an on time and an off time that are respectively less than the on and off times of the first main-phase drive circuit.